

Effects of selective K⁺-channel agonists and antagonists on myoelectrical activity of a locus of the small bowel

Miftakhov R., Abdusheva G.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

Effects of Ca²⁺-activated K⁺ and voltage-activated K⁺-channel agonists and antagonists on the myoelectrical and contractile activity of a locus of the small bowel are simulated numerically. The model assumes that the electrical activity of smooth muscle syncytium is defined by kinetics of a mixture of L- and T-type Ca²⁺-channels, Ca²⁺-activated K⁺ and voltage-activated K⁺-channels, and leak Cl⁻-channels, and that the smooth muscle syncytium of the locus is a null-dimensional contractile system. The results of modelling, both qualitatively and quantitatively, reproduce the effects of forskolin, lemakalim, phencyclidine, charybdotoxin and high concentration of external K⁺ ions, on gastrointestinal motility. This is confirmed by comparison with experimental observations conducted on the smooth muscle preparations of different species. © Springer-Verlag 1996.
